Reliance
Industrial SCADA/HMI system

Reliance 4

OPC

GEOVAP

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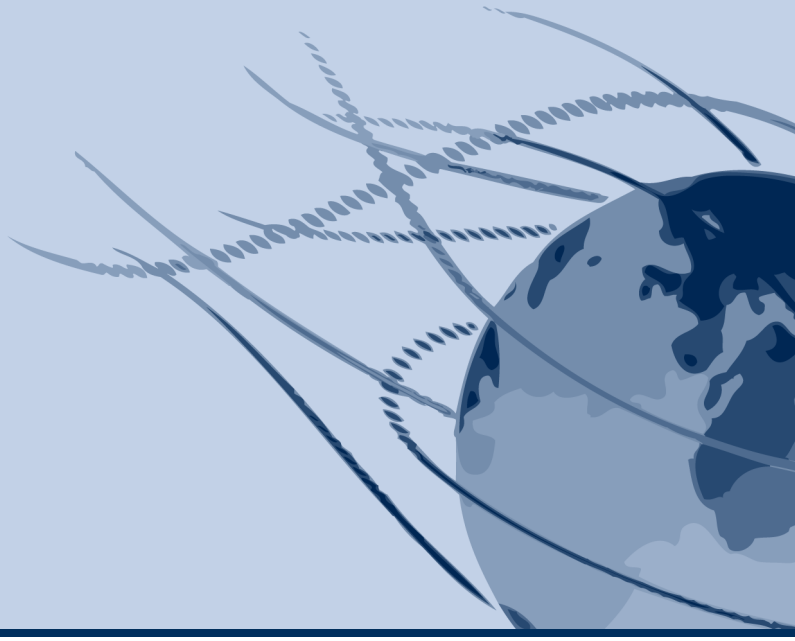

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1 What Is OPC?

OPC (*OLE for Process Control*) is a standard designed for real-time data exchange between a software application and process control devices such as PLCs. OPC defines an interface independent of the device type. As a result, the end user is almost not limited in the choice of hardware and software for his/her application. The only requirement is OPC compatibility.

There are two kinds of OPC components: OPC client and OPC server.

An **OPC client** is a program that gets (reads) the data from an OPC server for further processing. The typical examples are MMI and SCADA/HMI systems.

An **OPC server** is a program that provides data to OPC clients. It is usually designed to read data from a specific hardware device. An OPC client communicates with an OPC server through a strictly defined interface. As a result, any OPC client can communicate to any OPC server regardless of the type of device for which the server has been created.

The OPC standard is developed by the OPC Foundation organization grouping hundreds of software companies and hardware manufacturers worldwide. New features are continuously added to keep the standard up to date.

A tutorial demonstrating the basic aspects of the OPC standard is available on the website of Matrikon, a renowned OPC product developer company.

1.1 Data Transfer Principle

OPC server is usually a MS Windows application that communicates with a HW device (PLC) via device-specific protocol – server can communicate with HW device e.g. via serial line. Data acquired from HW device is provided via unified interface to other applications – **OPC clients**. OPC standard states, that several OPC clients (even from different companies) can connect to an OPC server concurrently. Most OPC clients (like **Reliance**) can connect to several OPC servers simultaneously.

1.2 OPC Server Configuration

OPC server is usually not provided only by HW device manufacturer, but also by other companies, so several OPC servers can exist for a device. The list of OPC servers for a specific device can be located on the OPC Foundation WWW pages.

After successful installation of an OPC server so called *configuration* have to be *created* and *registered*. To *create* the configuration means to define the list of devices connected to the OPC server, to define parameters of these connections and to define the list of tags (OPC items) that should be read from the device. Configuration have to be saved and *registered*, so it can be loaded immediately after OPC servers starts.

Note: OPC server installation, start and configuration is specific for every OPC server GUI (it is OPC server producer specific).

2 Reliance and OPC

Reliance is a modern *SCADA/HMI* (Supervisory Control And Data Acquisition) system designed for monitoring and controlling industrial processes. One of many features of the **Reliance** system is in-build OPC interface – **Reliance** is an *OPC client*.

The goal of this document is to describe steps required to create a simple visualization project (application) connected to an OPC server.

Creating a New Visualization Project

Creating a New OPC Device

Connecting New Device in the Project Structure Manager

Adding a Display Component to a Visualization Window

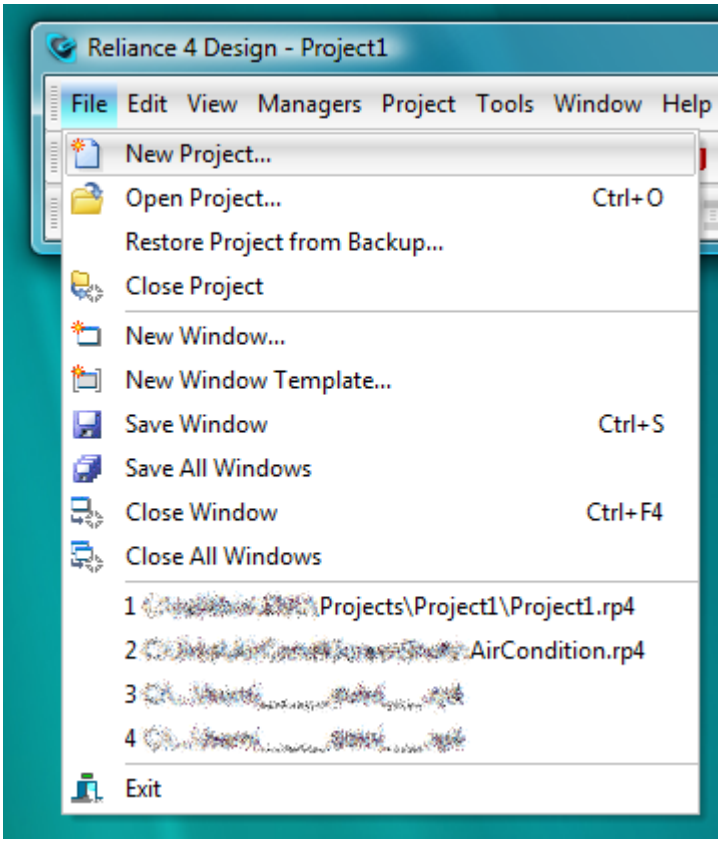
Creating a Link to the Display Component

Running the Project in a Runtime Software

For detailed information about the **Reliance** system, please visit www.reliance.cz.

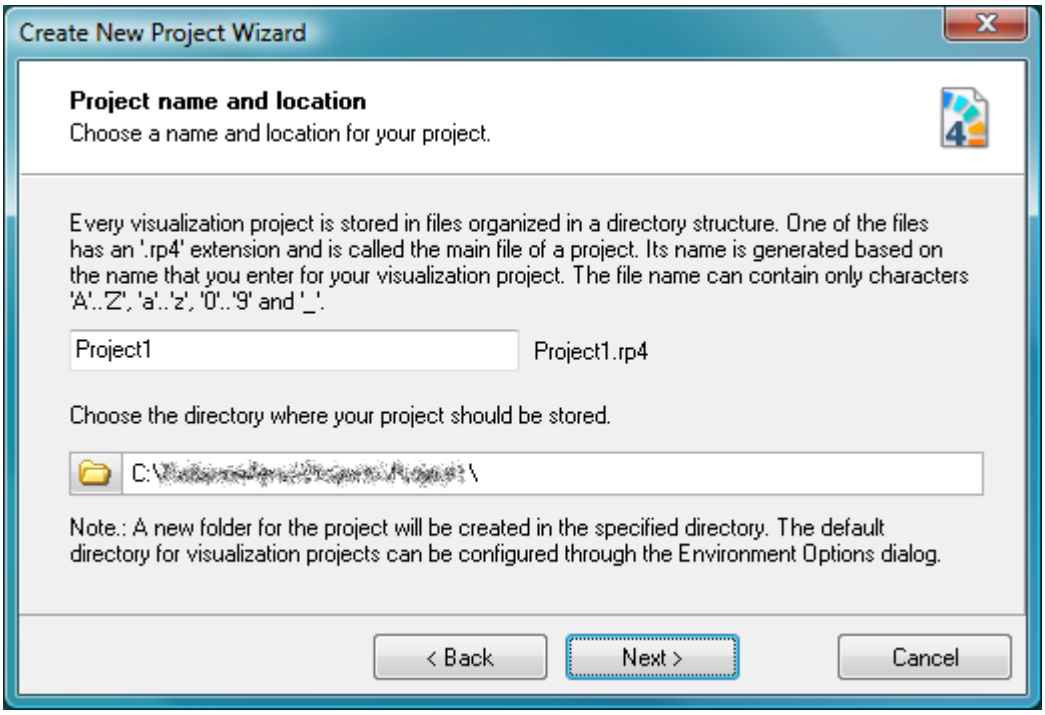
2.1 Creating a New Visualization Project

To create new visualization project, start the development environment *Reliance 4 Design* and select the *File* > *New Project* command.



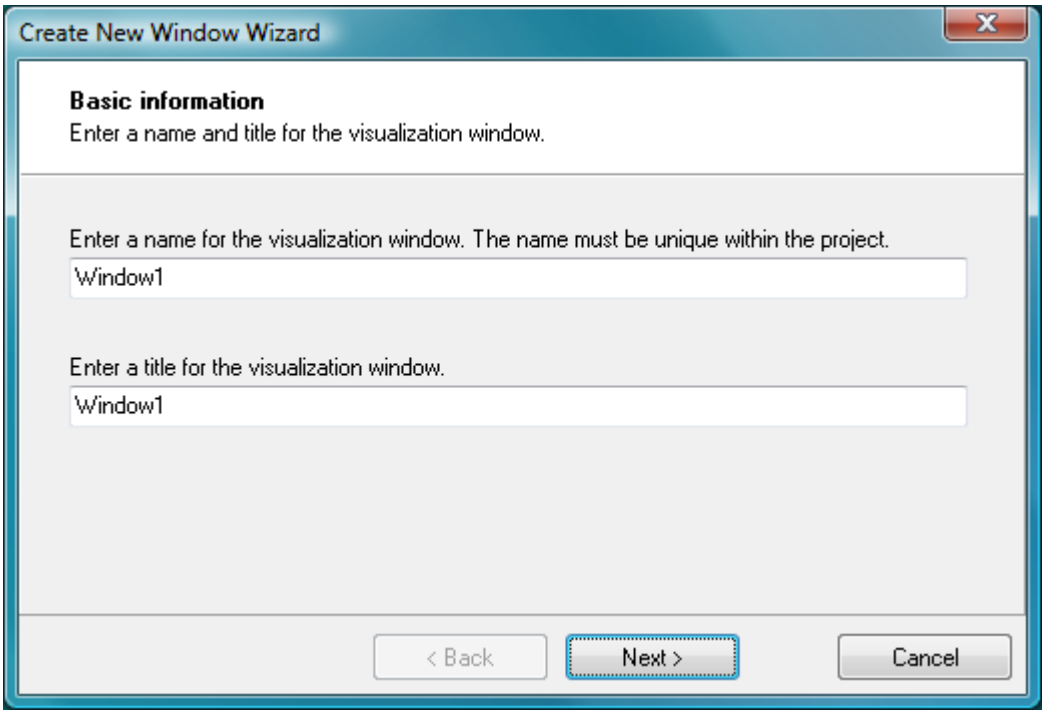
File menu

Enter a name of the new project (e.g. `OPC`) on the *Project name and location* page of the *Create New Project Wizard*. Change the default project directory if it is required and Finish the wizard (on the next pages keep default settings).



Create New Project Wizard

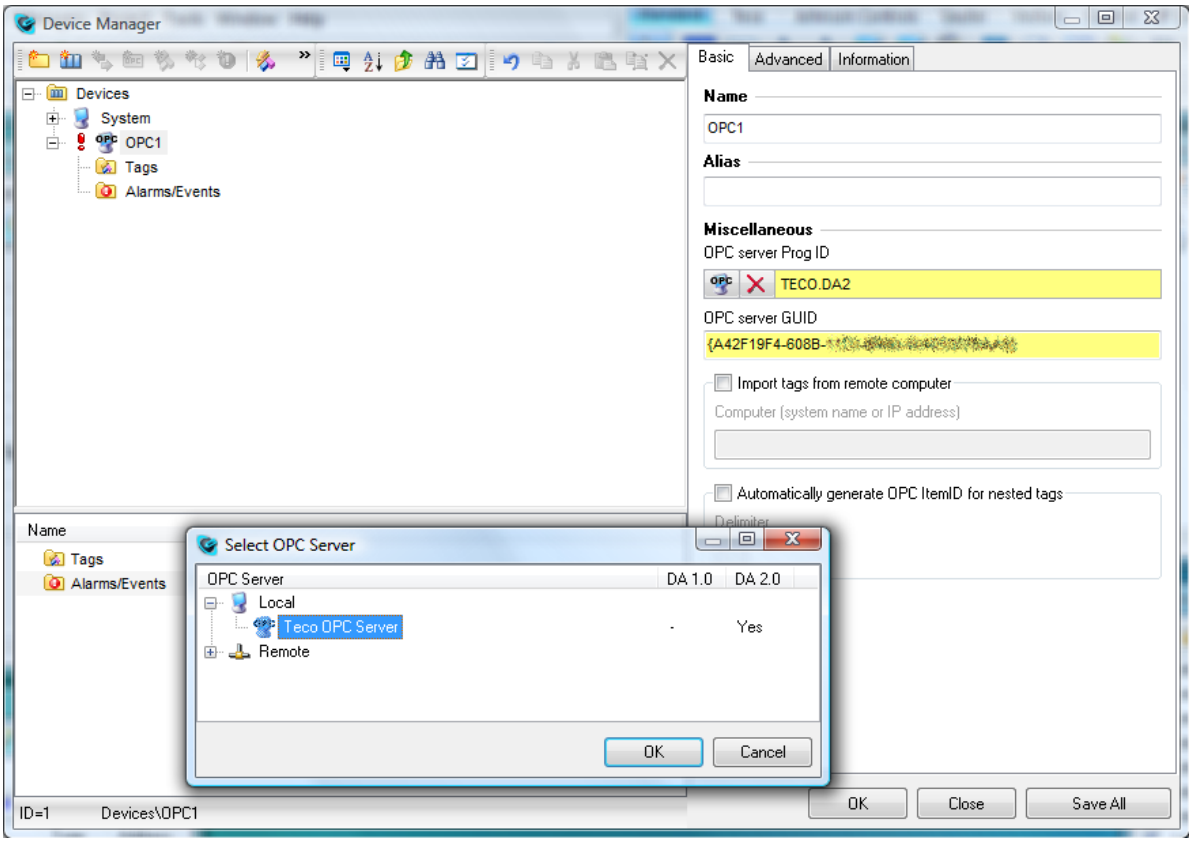
After a new project is successfully created, *Create New Window Wizard* automatically starts to assist in creation of the visualization window. Visualization window contains graphical elements (so called components), which define custom graphical user interface. On the first page of the wizard enter the *Name* and the *Title* of new window (or keep the default settings). Finish the wizard (on following pages keep default settings).



Create New Window Wizard

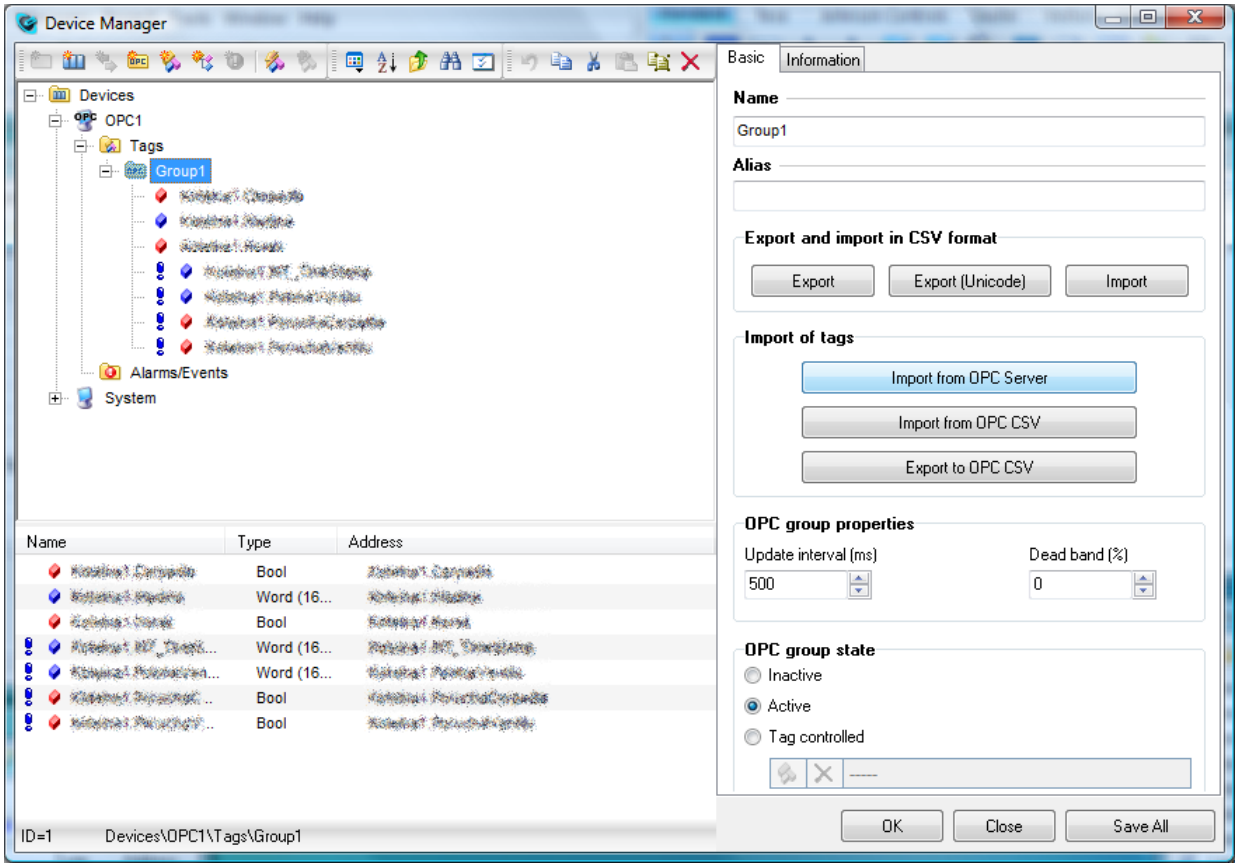
2.2 Creating a New OPC Device

Open **Device manager** via *Managers* > *Device manager*. Add a new OPC device with the *New Device* command (in the *Select Device Type* dialog window choose OPC). Select the device object in the upper left pane (in the tree) and configure the properties of the OPC device (on the left side of the window). On the *Basic* page define the OPC server identifier (OPC server Prog ID). The identifier can be entered either manually, or selected from the list of OPC servers installed on your system (after clicking the OPC icon).



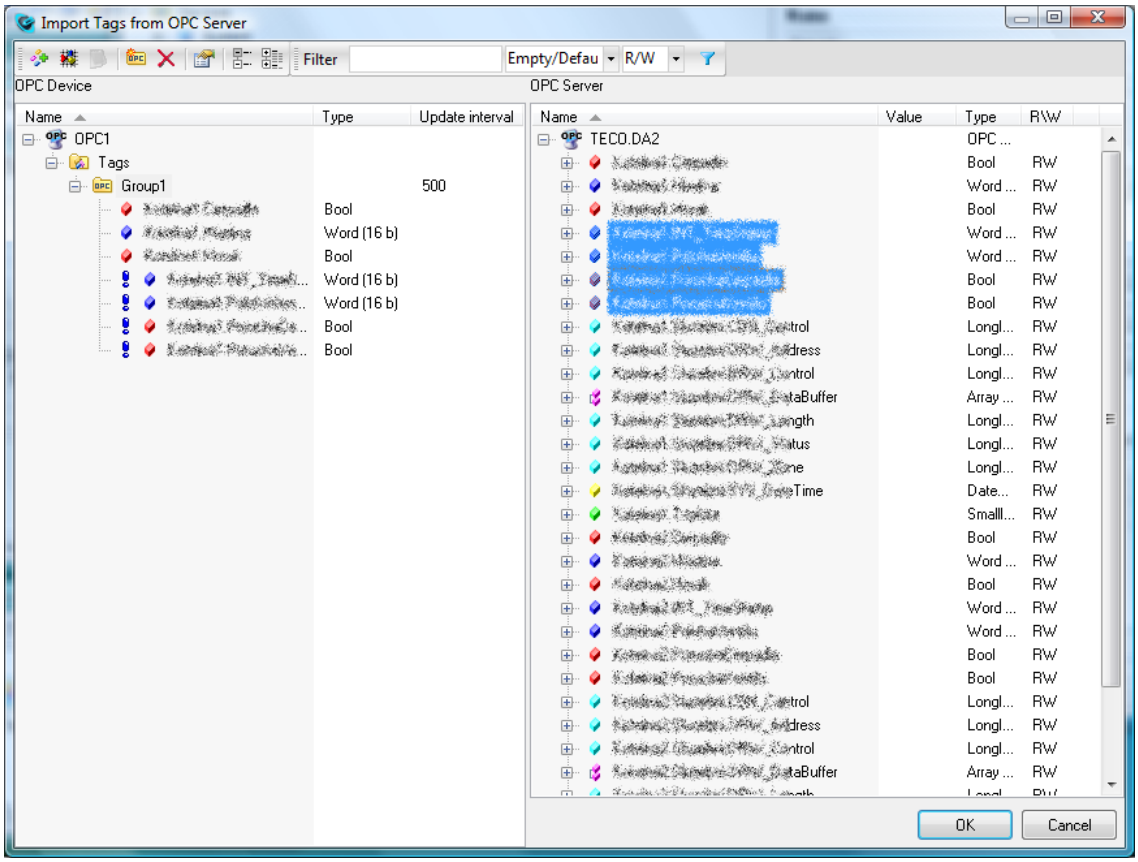
Device Manager – Select OPC server dialog

In the tree select the *Tags* folder of the `OPC1` device. Create a new OPC group via the *New OPC Group* command (from toolbar or local menu). You can change its name for example to `OPC`. Select the newly created folder object and via the *Import from OPC Server* command import tags (*OPC Items*) from the OPC server – installed OPC server should automatically start to provide the list of tags defined in its configuration.



OPC group properties

The *Import Tags from OPC server* dialog window is divided into a left pane with **Reliance** defined objects and the right pane with **OPC server** defined objects. Drag and drop objects from right to left pane with a mouse to import the tags form the OPC server.

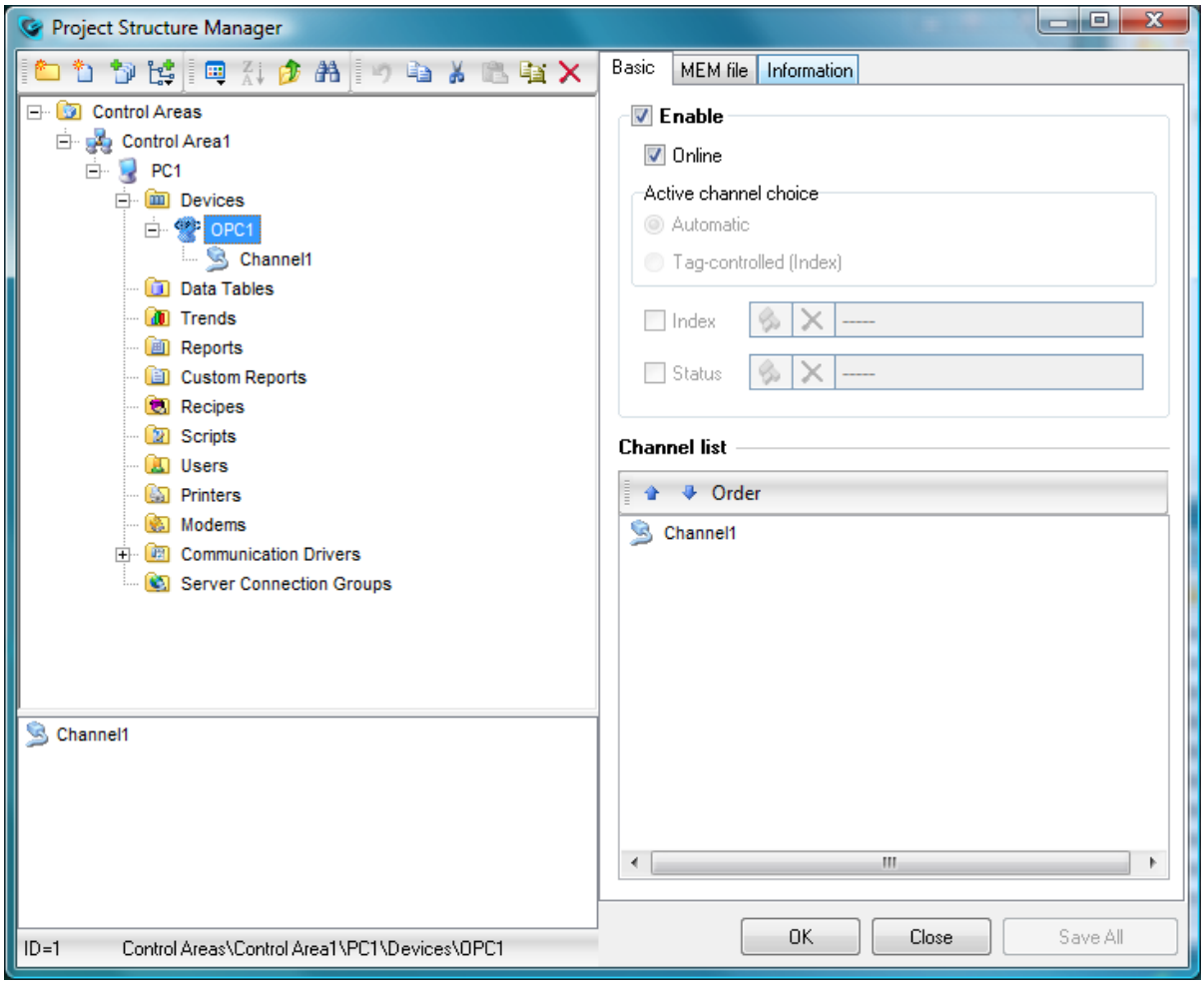


Import Tags from OPC Server dialog

2.3 Connecting a New Device in the Project Structure Manager

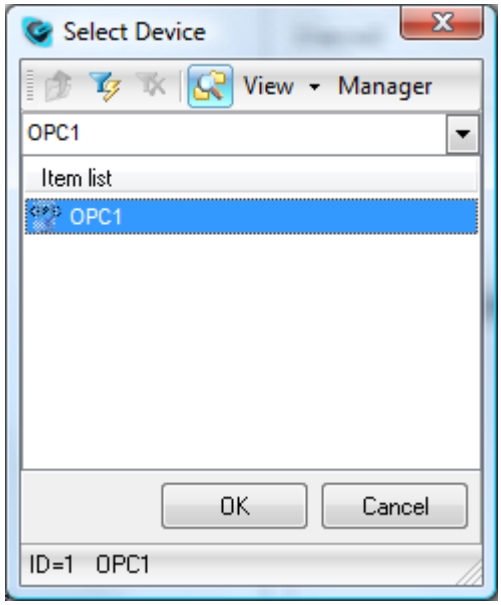
Each object that should be accessed on runtime have to be connected to a computer first. Connecting an object to a computer means to add an object to a specific folder in the *Project Structure Manager* under required computer (configuration). After the changes made in the *Device Manager* are saved, the user is asked if newly created object should be connected to the computer. If *Yes* is chosen, *Project Structure Manager* is **automatically** opened and OPC device is added to the *Devices* folder under the *PC1* computer. If *No* is chosen, object is not connected to any computer and it have to be connected later manually.

Before a device is connected, first open the *Project Structure Manager* (*Managers* > *Project Structure Manager*) and in the left pane (the tree) select the *Devices* folder. To **manually** connect a device to a computer chose the *Connect Devices* command from the local menu (or *Connect Objects* from toolbar).



Project Structure Manager

In the Select Device dialog window chose OPC1 device and confirm.

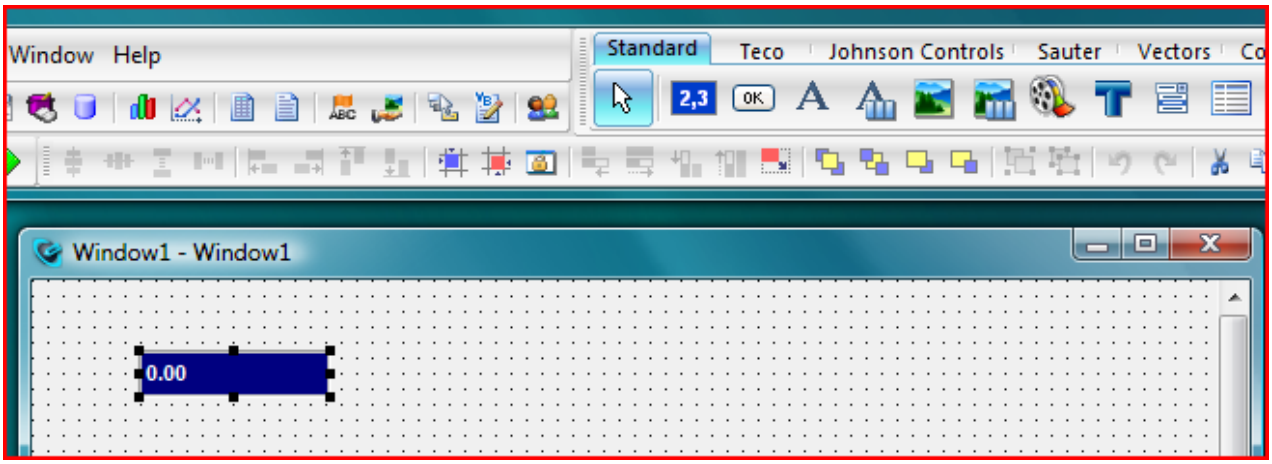


Select Device dialog

Close Project Structure Manager with the OK button to save the changes.

2.4 Adding a Display Component to a Visualization Window

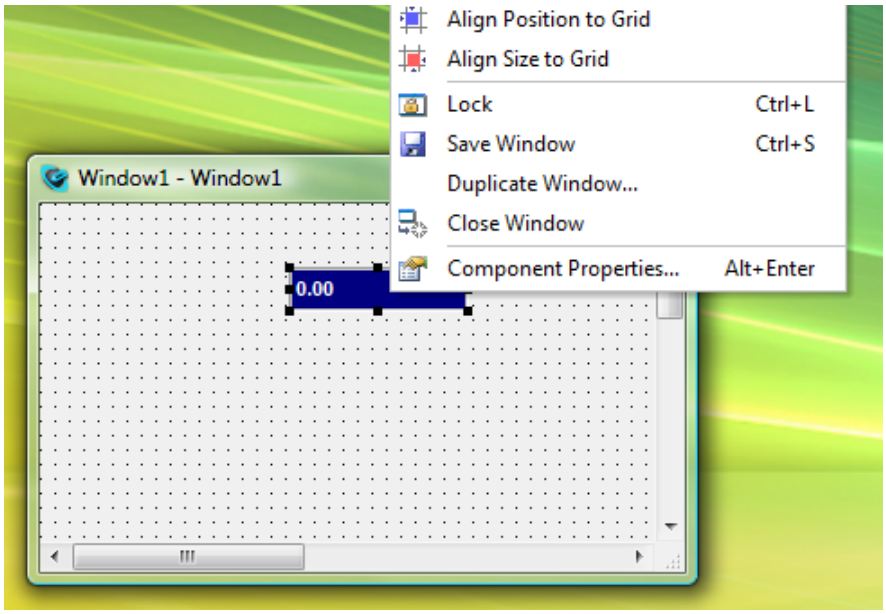
The *Display* component is located in the component palette (to the right from the main menu) on the *Standard* tab. Select the *Display* component in the component palette and click into the visualization window area to add the component.



Adding the Display component to a visualization window

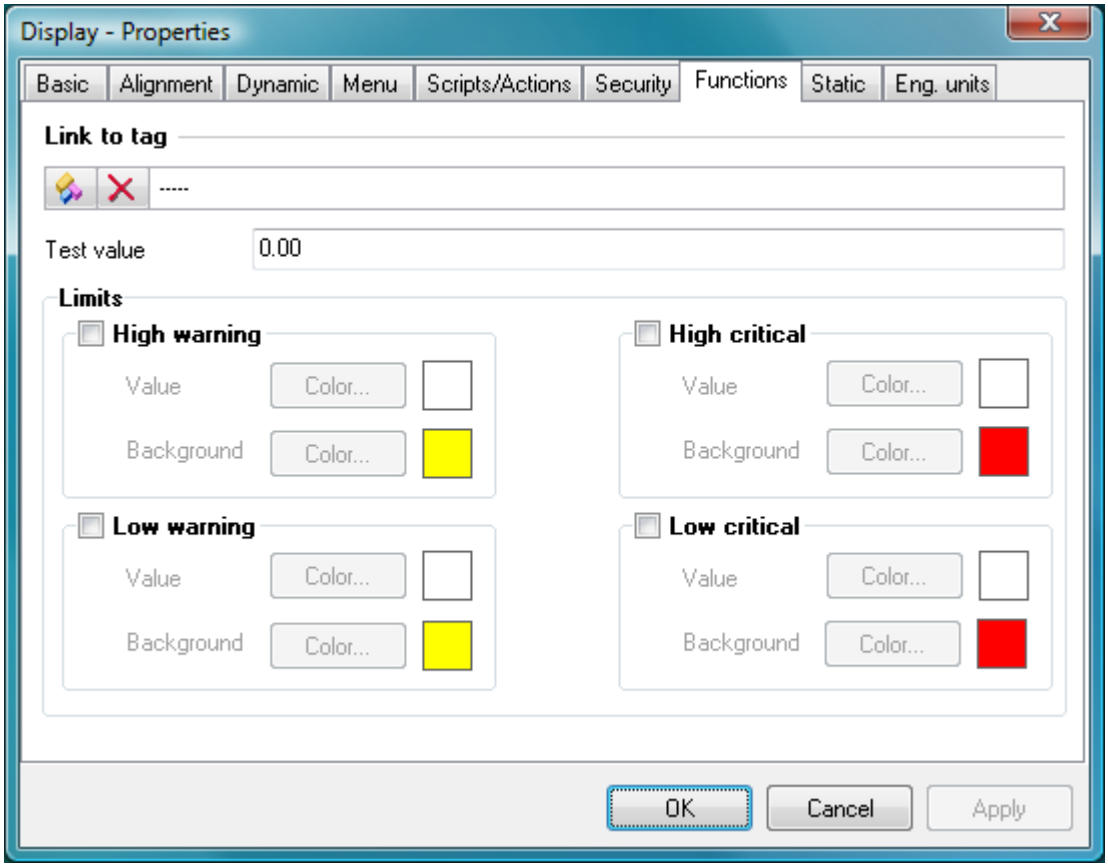
2.5 Creating a Link to the Display Component

Newly added display component have to be linked to a tag to show a value. Open the *Display Properties* dialog (e.g. double click on the component or select the command from the component's *Local menu*).



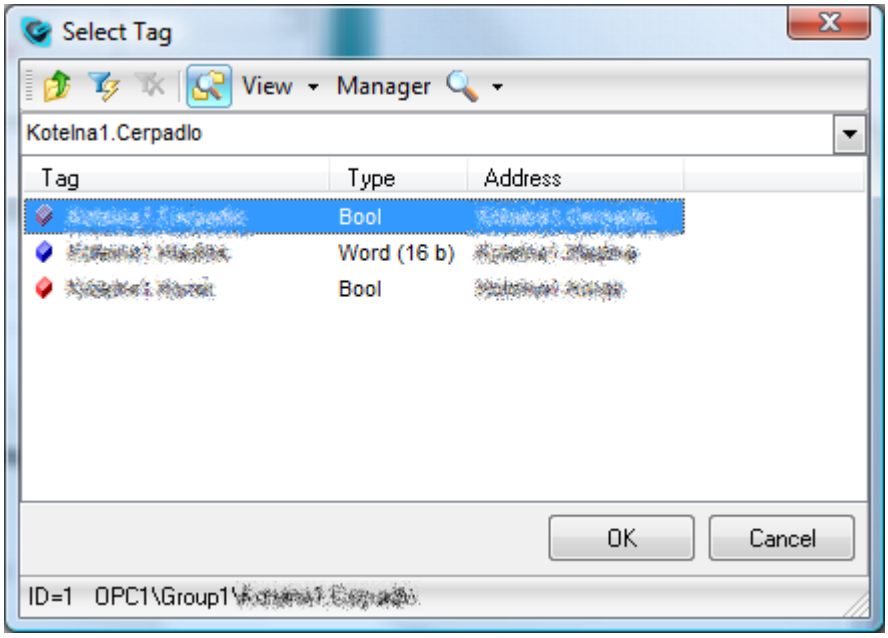
Component's Local Menu

On the *Functions* tab enter tag's full name in the *Link to tag* field. Tag name can be also selected via *Select Tag* dialog (dialog is shown after the icon on the left is clicked).



Display Properties

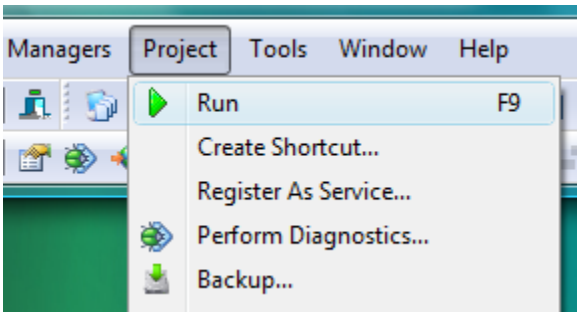
In the dialog window select the tag imported from the OPC server (see chapter Creating a new OPC device) and confirm the dialog with the *OK* button.



Select Tag dialog

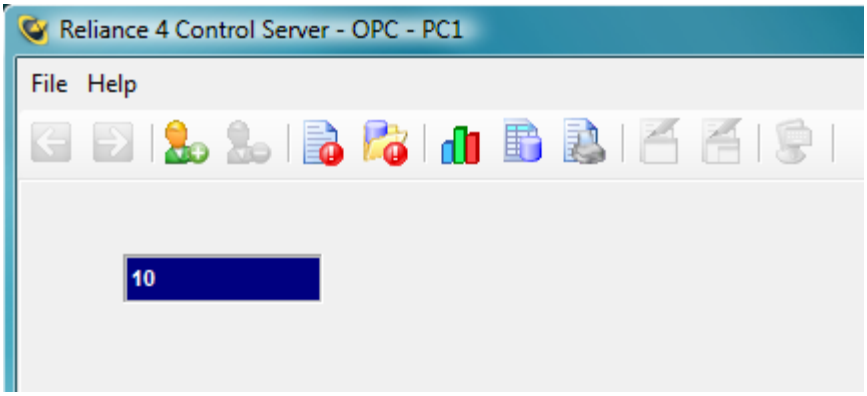
2.6 Running the Project in a Runtime Software

To start the project in the *runtime software* select the > *Project* > *Start* command from the main menu (or press F9). The type of started *runtime software* depends on the licence and on the settings in the *Project* > *Options* > *Runtime* (View, Control or Control Server).



Starting the runtime software

The display component shows the real-time value of the OPC tag.



Tag value displayed in the Display